

1. A packet switch for controlling flow of data in a network,  
comprising:

5           a plurality of output ports;

in said scheduler, each of said input port scheduling module receiving reservation condition information of a certain time slot from the scheduling module in the preceding stage and determining permission or rejection of reservation of packet transmission from said input port scheduling module in said reservation time slot, per time slot

means for reservation of packet transmission referring  
20 the reservation condition information received from the  
scheduling module in the prededing stage and the resevation  
request of own scheduling module and transmitting the result  
of said reservation of packet transmission to the scheduling  
module in the next stage;

25 means for defining a frame consisted of N in number of

time slots and performing reservation in N time slots in a next frame in a current frame period;

means, in the current scheduling module, for receiving said reservation condition information from the preceding  
5 scheduling module;

means, in the current scheduling module, for preliminarily determining a future time slot to access one of said plurality of output ports as the particular time slot in the next frame;

means for selecting one of said plurality of output ports  
10 for reservation for transmitting in said future time slot;

means for making judgment whether said future time slot has already been reserved by other scheduling module;

means for making reservation of said future time slot when said future time slot is not reserved by other scheduling  
15 module and putting information indicative that said future time slot is reserved in said reservation condition information;

means for transferring said reservation condition information to next scheduling module,

considering in viewpoint of reservation process in the  
20 time slot,

said reservation process being initiated simultaneously at the leading end of the frame, being progressed simultaneously in pipeline process, and completing simultaneously at the end of the frame;

25 said input port scheduling module having

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means for initiating process for respectively different reservation time slot in the next frame in each of a plurality of said reservation processes which are initiated simultaneously at the leading end of the frame; and

5 reservation order varying means for varying order of said reservation by said plurality of scheduling module,

said plurality of scheduling modules making reservation of ports to output with respect to a packet for next frame per each frame in the varied order.

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2. A packet switch as set forth in claim 1, wherein said plurality of scheduling modules performs said reservation in an order corresponding to logical connection order relative to other modules, said reservation order varying means varies  
15 a connection topology of said plurality of scheduling modules.

3. A packet switch as set forth in claim 1, wherein said reservation order varying means includes a switch performing switching operation for varying logical connecting condition  
20 of said plurality of scheduling modules and a table storing control data for controlling switching operation of said switch.

4. A packet switch as set forth in claim 3, wherein physical connection between said plurality of scheduling module and said  
25 switch is an electrical connection.

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5. A packet switch as set forth in claim 3, wherein physical connection between said plurality of scheduling module and said switch is an optical connection.

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6. A packet switch as set forth in claim 3, wherein said table is provided in each of said plurality of scheduling modules.

7. A packet switch as set forth in claim 3, wherein said  
10 table is provide in common for said plurality of scheduling modules.

8. A packet switch as set forth in claim 3, wherein said control data is data for controlling switching operation of  
15 said switch for varying time slot for initiating reservation of said plurality of scheduling modules per each frame at the leading end of each frame.

9. A packet switch as set forth in claim 3, wherein said  
20 control data is data for realizing scheduling equalizing use frequency of reservation start slot for initiating said reservation by a plurality of scheduling modules.

10. A packet switch as set forth in claim 3, wherein said  
25 control data is data for realizing scheduling equalizing use

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11. A packet switching method for determining connecting condition between input ports and output ports by making reservation for particular input port among a plurality of input ports for feeding data to a designated output port among a plurality of output ports in a scheduler of a switch having N in number of input port scheduling modules, comprising:

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        step of determining permission or rejection of reservation
        of packet transmission from said input port scheduling module
15  in said reservation time slot, per time slot

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means, in the current scheduling module, for receiving  
said reservation condition information from the preceding  
scheduling module;

25 means, in the current scheduling module, for preliminarily

determining a future time slot to access one of said plurality of output ports as the particular time slot in the next frame;

step of selecting one of said plurality of output ports for reservation for transmitting in said future time slot;

5 step of making judgment whether said future time slot has already been reserved by other scheduling module;

step of making reservation of said future time slot when said future time slot is not reserved by other scheduling module and putting information indicative that said future time slot  
10 is reserved in said reservation condition information;

step of transferring said reservation condition information to next scheduling module,

considering in viewpoint of reservation process in the time slot,

15 said reservation process being initiated simultaneously at the leading end of the frame, being progressed simultaneously in pipeline process, and completing simultaneously at the end of the frame;

step of initiating process for respectively different  
20 reservation time slot in the next frame in each of a plurality of said reservation processes which are initiated simultaneously at the leading end of the frame; and

reservation order varying step of varying order of said reservation by said plurality of scheduling module, and making  
25 reservation of ports to output with respect to a packet for

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next frame per each frame in the varied order.

12. A packet switching method as set forth in claim 11, wherein  
said plurality of scheduling modules performs said reservation  
5 in an order corresponding to logical connection order relative  
to other modules, said reservation order varying means varies  
a connection topology of said plurality of scheduling modules.

13. A packet switching method as set forth in claim 11, wherein  
10 said reservation order varying means includes a switch  
performing switching operation for varying logical connecting  
condition of said plurality of scheduling modules and a table  
storing control data for controlling switching operation of  
said switch.

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14. A packet switching method as set forth in claim 13, wherein  
physical connection between said plurality of scheduling module  
and said switch is an electrical connection.

20 15. A packet switching method as set forth in claim 13, wherein  
physical connection between said plurality of scheduling module  
and said switch is an optical connection.

16. A packet switching method as set forth in claim 13, wherein  
25 said table is provided in each of said plurality of scheduling

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17. A packet switching method as set forth in claim 13, wherein said table is provide in common for said plurality of scheduling modules.

19. A packet switching method as set forth in claim 13, wherein  
said control data is data for realizing scheduling equalizing  
15 use frequency of reservation start slot for initiating said  
reservation by a plurality of scheduling modules.

20. A packet switching method as set forth in claim 13, wherein  
said control data is data for realizing scheduling equalizing  
20 use order and use frequency of reservation start slot for  
initiating said reservation by a plurality of scheduling  
modules.